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Subje More BF thoughts  
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Yet more thoughts on comparison with the Yang model in preparation for Friday's call. From what I can tell (Redding et al. page 1632), a dose to the mother of 0.294 ug/kg/hr results in 16 ug/L in milk, which matches the empirical measurement of 16 ug/L PCB 153.

$0.294 \text{ ug/kg/hr} \times 24 \text{ hr/day} = 7 \text{ ug/kg/day}$  dose to mother, resulting in 16 ug/L PCB in milk

We use 1 mg/kg in fish at 18 g/day to get a dose to mother of 0.28 ug/kg/day. This results in a milkfat concentration of  $3 \text{ mg/kg-lipid} = 3,000 \text{ ug/kg-lipid}$ . At 4% milkfat content, this is:

$3,000 \text{ ug/kg-lipid} \times 0.04 \text{ kg-lipid/L milk} = 120 \text{ ug/L}$  for PCB 153 in milk.

This does not match up very well. We'll need to see if I have the units and conversions correct.

I find plenty of support for our assumption that PCB concentration in milkfat is equivalent to PCB concentration in body fat. But this looks like the key assumption where we disagree with the Yang model. And I'm willing to consider that we may have made a conservative assumption.

In our last call I pushed that fact that a mother loses half her body burden to the infant. It is the breastmilk concentration that is reduced to  $\frac{1}{2}$  during one year of breastfeeding (see, for instance, Lorber and Phillips 2002). If our assumption that chemical concentration in milkfat is equivalent to chemical concentration in body fat is incorrect, then the breastfeeding infant does not receive half of the entire body burden.

I also looked back to Dewailly et al. 1993 to see how we match up with empirical data. There are various numbers in this paper, but if I use a total PCB concentration of 500 ug/kg-lipid (for instance in seal blubber, Table 1) and an ingestion rate of 300 g/day (I'm not sure if this is lipid), the RA model calculates a PCB concentration in milkfat of 26 mg/kg-lipid. Table 1 and the Dewailly text give values of 1 mg/kg-lipid to 3.6 mg/kg-lipid. So again our model appears to overestimate the chemical concentration, although there are numerous uncertainties with this calculation.

I'm still trying to sort this out. It makes more sense to me that our model shows you don't need super high fish concentrations to result in the high measured breastmilk concentrations. This seems to apply more to average concentrations. The Inuit diet certainly has animals with very high PCB concentrations. We may be overestimating their risk. But that's why we are comparing the models.

- Mike